November 30, 2001

Ms. Tracey T. Piccone, P.E.
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33416 60/21853-02

Subject: Basin Specific Feasibility Studies -
Peer Review of Preliminary Alternatives for the
C-11 West, NNRC and NSID Basins

Dear Ms. Piccone:

Brown and Caldwell and members of our subconsultant team have reviewed the District's preliminary alternative combinations of water quality solutions for the C-11 West Basin, the North New River Canal Basin and the North Springs Improvement District (NSID) Basin. Overall, we find the District's set of alternatives in each basin to be good for the purpose of evaluating different approaches to meeting water quality goals. However, we have several comments and suggestions for the District to consider before finalizing the alternatives. These include the following:

C-11 West Basin

1. It is not clear what type of chemical treatment facility is being proposed in Alternative 1. The CTSS technology developed in the STSOC process employs flow equalization to reduce the size of the CTSS process units required. From the description of the chemical treatment component of this alternative, it does not sound like flow equalization is envisioned. This would tend to drive up the cost of the chemical treatment facility. We suggest clarification on this point or rewording of the description of the chemical treatment component in this alternative.

2. In Alternative 2, the STA component is described as "…consisting generally of 25% emergent vegetation, 50% submerged aquatic vegetation (SAV) and 25% periphyton STA (PSTA)". Is there any data to support the applicability of this

combination of biological treatment technologies for this basin? Given the low inflow P concentration in stormwater runoff from the C-11 West Basin (22 ppb), we question that an STA cell dominated by emergent vegetation would provide effective treatment. We believe an aquatic system dominated by SAV and/or periphyton would be more likely to reduce P concentrations.

As part of our review, the Brown and Caldwell team ran the Dynamic Model for Stormwater Treatment Areas (DMSTA) on stormwater runoff from the C-11 West Basin using the District's proposed 25/50/25 combination of biological treatment technologies. The results of the modeling show that it is possible to achieve a 10 ppb effluent P concentration even though none of the research studies to date have been able to consistently achieve this result. In our mind, this points out how important it is that the District establish a set of rules and procedures for how the DMSTA model is to be used (calibration data sets, etc.) in evaluating biological treatment alternatives in the Basin Specific Feasibility Studies. We believe that when these rules and procedures are established, the DMSTA model will become a valuable tool for determining the most effective combination of biological treatment technologies in each basin as well as for projecting P removal performance and land area requirements.

3. It does not seem reasonable to assume that a chemical treatment facility or an STA would continue in operation after June 2036 to treat 1 percent of the stormwater runoff from the C-11 West Basin. The 1 percent of the baseline flow to be treated most likely would not be evenly distributed throughout the year, suggesting that the treatment facilities would be idle for a majority of the time or would need to be kept in a standby condition. This might be possible with a chemical treatment facility, but not with an STA. Even if it is possible, there is no basis for estimating the cost of maintaining the treatment facilities in a standby mode or for projecting their treatment performance in such an operational mode. We suggest that the District consider eliminating the chemical treatment component of Alternative 1 and the STA component of Alternative 2 after June 2036 and making all three alternatives for the C-11 West Basin the same for the period 2036 through 2055 (source controls and CERP only).

4. We believe that, in some cases, significant cost savings may be realized if projects required to meet the water quality goals of the Everglades Forever Act (EFA) are combined with projects designed to meet the water quantity and distribution objectives of CERP. An example is the CERP reservoir proposed for the C-11 West Basin. If an STA was constructed in the short-term (December 2005) in the location where the CERP reservoir is to be constructed in the longer term (2018), and the STA was designed to be compatible with reservoir operation, it is possible that significant cost savings could result. At a

minimum, less land would need to be acquired. Some ancillary long-term treatment benefits might also result. Potential cost savings are associated with this approach and we suggest that the District consider a fourth alternative in the C-11 West Basin that would allow these cost savings to be defined.

North New River Canal Basin

We do not have any recommendations for changes to the preliminary alternatives proposed for this basin. We believe that the three alternatives proposed adequately cover the range of water quality solutions available.

North Springs Improvement District Basin

Alternative 1 calls for a chemical treatment facility to be constructed by 2006 and operated for one year until diversion of runoff from this basin can be diverted to the Hillsboro Impoundment in 2007. We do not believe this is a realistic alternative unless there are other potential water quality benefits to be realized from continued operation of the treatment facility. There are other less costly approaches to chemical treatment that could possibly be implemented on a short-term temporary basis (e.g. use of existing rock pits north of the NSID Basin). We would be glad to discuss these approaches with the District if there is any interest. However, we would recommend that the temporary (i.e. one year) chemical treatment alternative be eliminated altogether.

Another potential alternative for this basin would be to combine the diversion options in Alternatives 2 and 3. It may be possible that a temporary diversion for one year could be achieved in conjunction with planned conversion of agricultural land in the NSID Basin to urban land use between now and 2006. This would need to be coordinated with the developer(s) involved, but if it could be implemented, it would likely be much less costly than constructing a chemical treatment facility that would operate for only one year.

Summary

We hope these comments will be of benefit to the District in finalizing the alternatives to be evaluated by the Brown and Caldwell team in the Basin Specific Feasibility Studies. We will be glad to meet with you and other District Staff at your convenience to discuss them. In the meantime, if you have any questions, please do not hesitate to contact me

Very truly yours,

BROWN AND CALDWELL

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